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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/827,052	04/19/2004	Nobuyoshi Mori	534101-11	2282
27799 7590 05/23/2007 COHEN, PONTANI, LIEBERMAN & PAVANE 551 FIFTH AVENUE SUITE 1210 NEW YORK, NY 10176				
			EXAMINER DANIELSEN, NATHAN ANDREW	
			ART UNIT 2627	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/827,052

Applicant(s)

MORI ET AL.

Examiner

Nathan Danielsen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 April 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>07/06/04</u> . | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

1. Claims 1-17 are pending.

Priority

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Specification

3. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Objections

4. Claim 2 is objected to because "includes including" should be --includes--. Claims 2 and 10 are objected to because "a beam having a shorter wavelength" and "a beam having a longer wavelength" should be --a beam having a shorter wavelength-- and --a beam having a longer wavelength-- because when the light source emits two beams, each having a different wavelength, one wavelength will inherently be longer than the other. Appropriate correction is required.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1, 8, and 9 are rejected under 35 U.S.C. 102(b) as being anticipated by Jeong (US Patent Application Publication 2003/0053392).

Regarding claim 1, Jeong discloses an optical pickup apparatus comprising:

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a first laser source which emits a first beam (figures 5 and 9);
a second laser source which emits a second beam having a polarization plane substantially perpendicular to a polarization plane of the first beam (figures 5 and 9);
a polarization diffraction element which selectively diffracts one of the first beam and the second beam in accordance with polarized states thereof (figures 5 and 9); and
an objective lens which records or reproduces information by focusing the first beam which has passed through said polarization diffraction element onto an information recording surface of a first optical information recording medium, and records or reproduces information by focusing the second beam which has passed through said polarization diffraction element onto an information recording surface of a second optical information recording medium (figure 2 and ¶s 10 and 64).

Regarding claim 8, Jeong discloses where said polarization diffraction element is configured such that a birefringent medium and an isotropic medium are placed in contact with each other in an optical axis direction (¶ 49 and figure 7).

Regarding claim 9, Jeong discloses where the birefringent medium has a cross-section which is taken along a plane perpendicular to a traveling direction of incident light and is formed concentrically, and a cross-section which is taken along a plane in a radial direction including the traveling direction of the incident light and is formed in a sawtooth shape (figures 6 and 7 and ¶ 42).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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8. Claims 2-7 and 10-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jeong, in view of Kimura et al (KR Patent Application Publication 2003-0030926 and English language equivalent US Patent Application Publication 2003/0185134; hereinafter Kimura).

Regarding claims 2 and 10, Jeong discloses an optical system for an optical pickup apparatus, comprising:

an objective lens including a refraction lens, which has a positive power (figures 2, 5, and 9 and ¶s 10 and 64),

and a polarization diffraction element which selectively diffracts light depending on a polarization direction (figures 5 and 9),

wherein incident light from a light source is made to pass through said polarization diffraction element and the diffraction lens structure and is focused by the refraction lens having positive power (figures 2, 5, and 9 and ¶s 10 and 64).

However, Jeong fails to disclose the specific details of the objective lens and of the design of the diffraction structure in the polarization diffraction element.

In the same field of endeavor, Kimura discloses:

an objective lens including a diffraction lens structure, which has a plurality of rings with fine stepped portions formed on at least one of lens surfaces of the refraction lens (figures 3 and 4),

wherein a diffraction order in the diffraction lens structure at which a highest diffraction efficiency is obtained with respect to a beam having a shorter wavelength of a plurality of wavelengths used for information recording or reproduction is different from a diffraction order at which a highest diffraction efficiency is obtained with respect to a beam having a longer wavelength (¶s 447-455 and table 4), and

wherein said polarization diffraction element generates diffracted light which exhibits a highest diffraction efficiency at a predetermined diffraction order other than 0 when at least a beam having one wavelength of the plurality of wavelengths is incident in a predetermined polarized state (suggested by ¶s 447-455 and table 4 and figures 5-7 of

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Jeong; where Table 4 contains data concerning the design of a diffraction structure having the same shape as that in figures 6 and 7 of Jeong).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the apparatus of Jeong with elements of Kimura, for the purpose of forming appropriate wavefronts within prescribed necessary image side numerical apertures (abstract).

Regarding claims 3 and 11, Jeong, in view of Kimura, discloses everything claimed, as applied to claims 2 and 10. However, Jeong fails to disclose a diffraction efficiency for the polarization diffraction element.

In the same field of endeavor, Kimura discloses where said polarization diffraction element generates diffracted light with a diffraction efficiency of not less than 85% with respect to one of two incident light beams having orthogonal polarization planes (§s 372-388 disclose where it is possible to design diffraction structures having diffraction efficiencies greater than 85% for different diffraction orders and for different emitted wavelengths).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the apparatus of Jeong with elements of Kimura, for the purpose of forming appropriate wavefronts within prescribed necessary image side numerical apertures (abstract).

Regarding claims 4, 5, 12, and 13, Jeong discloses everything claimed, as applied to claims 2 and 10, respectively. Additionally, Jeong discloses the relationship between λ_1 and λ_2 (figure 9). However, Jeong fails to disclose a third wavelength, the details of the diffraction lens structure, and the conditions that must be satisfied.

In the same field of endeavor, Kimura discloses where said apparatus includes a third laser source which emits a third beam having a wavelength λ_3 such that a polarization plane becomes substantially perpendicular to a polarization plane of the first beam or the second beam, and letting λ_1 ($\lambda_1 < \lambda_3$) be a wavelength of the first beam, m_1 be a diffraction order at which a highest diffraction efficiency is obtained when the first beam passes through the diffraction lens structure, λ_2 ($\lambda_1 < \lambda_2 < \lambda_3$) be a wavelength of the second beam, m_2 be a diffraction order at which a highest diffraction efficiency is obtained when the second beam passes through the diffraction lens structure, and m_3 be a diffraction

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order at which a highest diffraction efficiency is obtained when the third beam passes through the diffraction lens structure, the following condition is satisfied, and said polarization diffraction element selectively generates diffracted light when one beam or two beams pass therethrough

$0.9 < |m_1 \cdot \lambda_1| / |m_2 \cdot \lambda_2| < 1.1$ (Table 4; where the diffraction orders of 3 and 2, corresponding to wavelengths of 405 nm and 650 nm, respectively, satisfy this condition:

$$(3 \cdot 405) / (2 \cdot 650) = 1215 / 1300 \approx 0.935) \text{ and}$$

$|m_3 \cdot \lambda_3| / |m_1 \cdot \lambda_1| < 0.9$ or $|m_3 \cdot \lambda_3| / |m_1 \cdot \lambda_1| > 1.1$ (Table 4; where the diffraction orders of 3 and 2, corresponding to wavelengths of 405 nm and 780 nm, respectively, satisfy this condition: $(2 \cdot 780) / (3 \cdot 405) = 1560 / 1215 \approx 1.284$).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the apparatus of Jeong with elements of Kimura, for the purpose of forming appropriate wavefronts within prescribed necessary image side numerical apertures (abstract).

Regarding claims 6 and 14, Jeong, in view of Kimura, discloses everything claimed, as applied to claims 5 and 13, respectively. Additionally, Jeong discloses where said polarization diffraction element selectively diffracts the two beams having the aligned polarization planes (figure 5). However, Jeong fails to disclose where diffraction efficiencies for the two wavelengths become maximized at different diffraction orders.

In the same field of endeavor, Kimura discloses where diffraction efficiencies for the two wavelengths become maximized at different diffraction orders (Table 4, in combination with ¶s 372-388).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the apparatus of Jeong with elements of Kimura, for the purpose of forming appropriate wavefronts within prescribed necessary image side numerical apertures (abstract).

Regarding claims 7 and 15, Jeong, in view of Kimura, discloses everything claimed, as applied to claims 1 and 10, respectively. However, Jeong fails to disclose where said polarization diffraction element is driven integrally with said objective lens.

In the same field of endeavor, Kimura discloses where said polarization diffraction element is driven integrally with said objective lens (figure 4).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the apparatus of Jeong with elements of Kimura, for the purposes of correcting coma aberration and obtaining excellent tracking characteristics (§ 405).

Regarding claim 16, Jeong, in view of Kimura, discloses everything claimed, as applied to claim 10. Additionally, Jeong discloses where said polarization diffraction element is configured such that a birefringent medium and an isotropic medium are placed in contact with each other in an optical axis direction (§ 49 and figure 7).

Regarding claim 17, Jeong, in view of Kimura, discloses everything claimed, as applied to claim 16. Additionally, Jeong discloses where the birefringent medium has a cross-section which is taken along a plane perpendicular to a traveling direction of incident light and is formed concentrically, and a cross-section which is taken along a plane in a radial direction including the traveling direction of the incident light and is formed in a sawtooth shape (figures 6 and 7 and § 42).

Citation of Relevant Prior Art

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.
 - a. Takeuchi et al (US Patent Application Publication 2002/0172132) disclose an objective lens having diffraction structure in which different diffraction orders are optimized for different wavelengths (Table 3).

Closing Remarks/Comments


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nathan Danielsen whose telephone number is (571) 272-4248. The examiner can normally be reached on Monday-Friday, 9:00 AM - 5:00 PM Eastern Time.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William Korzuch can be reached on (571) 272-7589. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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05/07/2007


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